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COMPLIMENTS OF
A. CLENDINEN,
With request of return comments.

Resumé of Yellow Fever,

(Quarantine and Home Sanitation,)

BEING ABSTRACT OF REPORT BY

A. CLENDINEN, M. D.,
As Chairman of Committee of Intelligence, District Society of Bergen County.

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ESSAY.

BY A. CLENDINEN, M. D., OF FORT LEE.

RESUMÉ OF YELLOW FEVER.

(*Quarantine and Home Sanitation.*)

There are those, Carpenter and others, who start the history of yellow fever as following the British visit to Siam, (1612), although in fact but very little intercourse was had till after 1821. To 1690 it has been credited and as grafted by the after importation of Balam fever. There are others who first note its demonstration in connection with since visits to the coast of Africa. The description by Hippocrates, 361 B. C., of divers fevers and kinds of *black vomit*, certainly as well mark its diagnosis as the reports of to-day. The general recognized limits of its demonstrations, from the reports which we have, may be said to be from about 43° N. lat. to 35° S. lat. on the east coast of America; and 33° S. lat. on the west. In the Old World, between 43° and 44° N. (N. of Spain) and 8° or 9° S. lat. (Ascension and Loando) perhaps further along the W. and E. coast of Africa. J. M. Toner, M. D., in his Natural History and Distribution in the United States, dates his record from 1668, (to 1874), and notes its visitation to 128 points. In the late report of Board of Experts its first noted visitation is to Boston, *claimed by importation* in 1693, and in 1699 to Philadelphia, both from Barbadoes. In 1702 to New York from

St. Thomas, and to Charleston from *somewhere* in the West Indies, they assume, in 1796,* and of demonstrations in 88 different years. They claim them as "invasions," "importations," in 77 recorded years: and of these, in 71 their declared evidence points to the West Indies as the source of the infection. Toner, in his notes of Demonstration, marks the Elevation above the sea: Mobile, Ala., 28 D. 20 E.; Montgomery, 4 D. 150 E. (on Alabama river) above the sea; New Haven, Conn., 6 D. 35 E.; Key West, Fla., 14 D. 15 E.; Pensacola, 22 D. 15 E.; St. Augustine, 4 D. 10 E.; Savannah, Ga., 9 D. 30 E.; Alexandria, (Red river), La., 10 D. 75 E.; Baton Rouge, 9 D. 50 E.; New Orleans, 65 D. 10 E.; noted mortality from 1769 to 1873, inclusive, 32,832; Washington, La., 6 D. 65 E.; Baltimore, Md., 14 D. 60 E.; Boston, Mass., 10 D. 45 E., commencing 1691; Natches, Miss., 13 D. 150 E.; Pass Christian, near St. Louis Bay, 4 D. 15 E.; Rodney, 4 D. 175 E.; Vicksburg, 5 D. 175 E.; Woodville, 15 miles E. of Mississippi river, 5 D. 100 E.; New York, 63 D. 35 E.; of these the notable epidemics were 1798, 1803, 1702, 1743, 1795 and 1805. 37 of the 63 years noted in all recorded 197 deaths in the (Port) Marine Hospitals, and many of the other number are deaths of by land refugees from Norfolk and elsewhere, and since 1822 none but marine cases noted. *New Jersey* showed in Bridgeton, Cumberland Co., on the Cohansey Creek, at an elevation of 50 ft. above the sea level, in 1798, and at Gloucester City, Camden Co., on the Delaware river, E. 20 in 1805. At Perth Amboy, Middlesex Co., on the Raritan bay, in 1811, 5 cases are noted; and at Port Elizabeth, Cumberland Co., on Maurice river, E. 20, in 1798, 6 deaths are noted. It also showed at Woodbury in 1798. Wilmington, N. C.,

* Simons notes it in Charleston in 1699, and Toner for 15 different years before 1793.

E. 25 D. 4, in 1796, 1800, 1821, 1862; Dr. E. A. Anderson, in his since report to date, notes sporadic demonstrations in 1863, 1864, 1865, 1869 and 1870. Philadelphia, Pa., E. 35, from 1695, shows 34 demonstrations, in all 14,483 mortality, of which nothing to speak of since 1805, except 128 in 1853. Providence, R. I., E. 35, 5 D.; Charleston, S. C., E. 10, 52 D., in which the mortality is rated in but few, in all 4,432 (very incorrect.) Mt. Pleasant, on Wingaw bay, E. 10, 6 D; Memphis, Tenn., on Mississippi river, E. 260, D. 4; mortality noted 1,244 up to 1873; Galveston, Texas, E. 5 D. 10, mortality 3,725; Houston, Tex., on Buffalo bayou, E. 50 D. 10, no mortality noted; Indianola, Tex., on Matagorda bay, E. 10 D. 6, 80 mortality noted; Norfolk, Va., on Elizabeth river, E. 20 D. 18, 2,060 mortality recorded, being notations of for 1800, 250; 1854, 3; 1855, 1,807. Of the 128 places noted, the above only refer to those showing on 4 or more occasions. From "Sketch of the Geography of Epidemic Yellow Fever since the close of the last century," read by Garvin Milroy, M. D., F. R. C. S., before the Epidemeological Society of England, of which he was then President, (see *Med. Chir. Rev.*, 1864), I drew many of the following notes: He says, "After an absence for a good many years in an *epidemic* form, yellow fever made its appearance about 1793 in the W. Indies, and at several points on the American coast, between Guinia to the S. and the seaboard of New York and Pennsylvania to the N. Grenada, Dominica, Barbadoes and Jamaica were among the first attacked; *but prior to this invasion* the disease had been prevailing in Charleston,* S. C., and other southern cities of the U. S. of A., as well as the coast of Guiania and adjacent settlements." He speaks of Sir Charles Gray's

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experience in the capture of the French W. I., Martinique, St. Lucia and Gaudaloupe, and at St. Domingo in 1794, loss of life 6,000 to 10,000 by malignant fever. Notes that Humboldt says, yellow fever absent from Vera Cruz in epidemic form since 1776, and sporadic in 1786, and again epidemic (there) in 1794; Philadelphia in 1793, 1794, and says: "This alternate cessation and reappearance is a character common to yellow fever and other epidemic diseases, and must have been strangely overlooked by Dr. Chisolm and other writers of that day, when they imagined that the malignant pestilence of 1793 in the West Indies was a new and foreign distemper *imported* by a sickly ship from the western coast of Africa." From the above time it has, in the Islands of the Carribean sea, in Mexico, at various points on the South American coast, in Peru, &c., (see Arch'd Smith's Rep't), and North American Gulf and Atlantic States as far north as New Hampshire, alternately, continuously shown, epidemically. In Spain, it was claimed to have been absent 30 years or more (epidemically), and was first noted at Cadiz. Heat excessive and intolerably oppressive from prevalence of E. of wind "Levanter," and great death of lower animals with like (human) symptoms. There was an outcry against some smugglers from South America. The cry came from a low, crowded, filthy hole, so long as they remained to tell the tale; for they died at the rate of 200 per day out of 58,000 inhabitants. It is next noted in Pond de St. Mary's, Xenes, Seville, (10,000 mortality), and Gibraltar, of whose marble front we have been reminded as indicative of presumed salubrity. The zoologist will find by the "Pillar of Hercules" indications of the monkey without a tail. Nowhere else in Europe does there appear ever to have been so rapid and *positive a change of bases.* Here Greek met Greek in the

tug of war between the carbonaceous matter of the Mediterranean and the chlorine of the ocean. Guns are mounted on these heights, but at their *base* to the rear east around in the bay of Gibraltar lies the *entrepot*, including barracks, shipyards and all.

Gibraltar is the sluice-gate of the Mediterranean, and always called "filthy." It was noted this year as unhealthy and with a mortality four times as high as usual, and Dr. Trotter* states that "in the autumn of 1799, a bilious fever, with the characteristics of yellow fever of the West Indies, prevailed to a considerable extent at Gibraltar, and it is noteworthy that at the same time the towns Ceuta and Gangiers on the opposite shores of the strait were affected with a malignant fever of the same character." The straits are from 19 to 23 miles wide, and these demonstrations were in the low coves on both sides, often noted in various degrees, whilst not showing higher up the inland water. Some state that Cette, in the Gulf of Lyons, and the city of Geneva, suffered this same season. Next noted show is at Cadiz, in summer of 1801—then in October the inland towns of Medina, Sidonia, and others. "There were demonstrations this year in Gibraltar," and in the islands of Dominica and Martinique epidemics noted, and in 1802 and 1803. Yellow fever was wide spread in the West Indies and on the American coast—Charleston, Philadelphia, &c. Malaga both years—in July and August; and in Cadiz in the autumn. The line of wind, "Levanter," was from the east, and followed along the base of the Ronda mountains, some of it leaving the "Mons Calpe," of Gibraltar to the south, and, after crossing the sandy isthmus (about $1\frac{1}{2}$ miles long and wide) and the islet of La Caracca, where are the most important shipyards and arsenals of the kingdom, struck

* Medica Nautica, vol. ii. p. 428.

Cadiz on the Atlantic. There were in this year suspicions at Gibraltar, and in 1804, which was notable for the unusual prevalence and fatality of the fever in the south of Europe. Henning says, while commenting on the fever in Gibraltar, "whilst the east wind blows, the sewers throughout the town emit the most offensive vapors." Dr. Donald Monro, in his work on the Health of the Army, published last century, says that, "in hot months, June, July, August and September, the garrison and inhabitants of Gibraltar, are subject to bilious and putrid fevers, and that new comers seldom escape them in a violent form." In 1804, the garrison, 3,500 strong, lost 864 men and officers, besides 164 women and children. Of civilians, 4,854 perished, out of a population of between 15,000 and 16,000. (See Sir Gilbert Blane's 2d Report.) Some left for Barbary, others for Malta—freely at first—but "no ill effects occurred anywhere from the arrival of the fugitives." Between the months of June and December, the whole of the south and south-east of Spain appears to have been more or less infected; numerous towns in the provinces of Cadiz, Seville, Cordova, Malaga, Grenada, Murcia, Alicante, &c., were seats of disease. Earliest again, June, in Malaga. In August, 1804, it showed in the port of Leghorn,* and was a malignant fever, regarded as yellow fever, and showed, it was said, soon after the arrival of a vessel from Havana. More than 6,000 of the

* The Port of Leghorn is situated in a marshy district, and is surrounded by walls. It is now (1879) kept very clean; the streets are wide and well paved. There is an inner and an outer harbor. There is a lazaretto of St. Rocco, said to be the finest establishment of the kind in Europe, consisting of a variety of buildings, divided into squares—throughout which there is a constant and free circulation of air. The warehouses are airy and extensive, and the merchandise after being opened remains untouched for a certain time. You see in her since record, the lesson she learned—to keep clean at home, drain land, pave streets, and have outer before inner harbor. "*Pratique*" she finds she can afford, as her coral factories and general trade, and daily increase in health show.

inhabitants fled (the French troops at that time at Tuscany) to Pisa, 12 miles N. E. of Leghorn, and now connected by railroad, but the disease did not spread beyond the suburbs of Leghorn. Whether about this time the epidemic at Corfu, supposed to be yellow fever, and which generally proved fatal on the fifth or seventh day, was really that disease, there is no way now to determine. In 1804 and 1805, West Indies and southern part of United States gave demonstrations, and Sir G. Blair says, that the mortality in fleet in 1804 was nearly three times greater than in 1782. From 1804 to 1810 no epidemics in Spain recorded. (Material required cumulation.) But in Cadiz, in the very same crowded, filthy sections as in 1800 and 1804, it again appeared in 1810. The town was crowded with thousands of persons flying from the invading French. No smugglers are spoken of, but instead this comment: "On this as on former occasions it could not be traced as extrinsic." The next noted point was Carthagena, (which lies in a natural basin, with very extensive shipyards—even for men of war, and is the principal naval station and arsenal of Spain—and by the Lorca canal communicates with the river Sequin), she lost over 3,000. On the Island of Teneriffe, in the port of Santa Cruz, yellow fever showed and was claimed by some to have been started by a vessel bringing French prisoners from Cadiz. Sir J. Fellows says: "In March of this year, 1810, a dreadful mortality occurred among the poor French prisoners captured at Baylon, on board the hulks in Cadiz bay. * * The extreme misery and filth of these men, laboring under every description of privation and depression, gave rise to a malignant fever of so contagious a nature that all the Spanish guards and hospital assistants who were ever among them, caught their disease, of which many died." "In 1814 it showed

among the vessels of war in the Bay of Gibraltar, and in the town, commencing on shore in Cavallero's buildings, rivaling Boyd's in impurity and unwholesomeness." "For 5 years after this, Spain seems to have been nearly if not quite exempt; but during the interval and more especially in 1817 and 1819, the pestilence is known to have prevailed in some West India Islands, as Antiqua, Dominica, Jamaica, Gaudaloup, and also in the Southern States of U. S." Dr. Hancock, in his valuable treatise on Laws and Phenomena of Pestilence, says: "1819 was remarkable for the general spread of epidemic and pestilential diseases over the world; India and the E. and S. of Europe as well as the N. W. parts of Africa, were visited by the forms of disease peculiar to their several climates. Nearly all the West Indies with the adjacent shores of the American Continent about Demarara and New Orleans were ravaged with pestilential fevers. Disease was so prevalent in the cities of the United States that the President thought it a subject deserving notice in his opening speech in Congress."

Yellow fever showed in (Spain) Andalusia, Cadiz, and Malaga, in 1821. In Barcelona, Catalonia, the north-east part of Spain—it began in July and went beyond the military cordon—to Torlosa, on the shore of the Ebro, (the Iberus of the ancients, two hundred and fifty miles long,) and to the inland towns of Mequerenza, and to Lerida, (on the Segra, eighty miles up from Barcelona,) where it ceased in December. In 1821 and 1822, it is again noted in Baltimore and New York, and in 1823 in Sierra Leone, on the northwest coast of Africa, and the West Indian Islands also suffered severely.

The isolated partial outbreak at the Port of Passage, close to St. Sebastian, in Biscay, occurred in August. It was claimed to be connected with the vessel recently

arrived from Havana. There had been no sickness on board and she had been in quarantine for ten days, as a *precaution*. It was on opening the hold and discharging the cargo, that the first attack occurred, it is said, in persons, *strangers* to the shore. Of twelve carpenters employed in removing rotton timbers of the hold, six were attacked in rapid succession. Several cases occurred on shore, in some filthy, crowded houses, near where the ship was moored; but the disease did not spread and soon ceased.

On the tropical shores of the Pacific, prior to 1852, yellow fever was noted, and in 1853 as occurring in Cobija and in Guiaquil, in December; in March, in Lima and southward, extending to most of the towns on the coast. So Jno. W. Dana reports to the Sanitary Commission of New Orleans, in 1853, in whose report is a compilation of evidence from various quarters of South America, and on the lines of the Gulf, so sorted and discussed by Barton as to leave little now to be said. Sporadic cases were frequently noted, as in the low sections of Bolivia, which cover not much area, however, and are tempered by the cool waters and air of her mountains, and the same effect in varied degree is felt along the entire Pacific coast, which offers a comparative connex line for the rebuff of waters, and whose lofty mountain ridges so treat the air, that when it retrogrades back to shore it differs in toto from that of the Gulf of Mexico, or the general Atlantic coast. The eflux atmosphere of the Mississippi valley is doubled in the Gulf, and the lines on both sides of the Atlantic so lie that in sun expansion its waters play from the west coast of Africa to our coast, and sweeping to the south of Cuba, after circuit of Gulf, pass the mouth of the Mississippi, cushion on the north side of Cuba, pass the Keys of Florida and return to the European side, for the outwash of the Mediterranean.

Such tropical interchange and pocketing does not occur on the Pacific, and herein lies much explanation of the lines of this humid, tropical fever. 1853 was a most fatal year in Brazil, attacking people of all races, alike, so says H. M. Bates, in his "Naturales on the Amazon," 1863; and there was quite an amount this 1878, so say the press and the captains I have met.

St. Nizarre, France, notes a demonstration in 1862, and others in Spain and Portugal, and in Lisbon there is now officially yellow fever. In Swansea, South Wales, 1865–66. 1865, reported by Dr. George Buchanan, in "8th report of Med. Off. to the Privy Council of 1865," p. 442, he speaks of the period as in condition of tropical heat, and twenty-two cases of the fever, exclusive of doubtful subsequent cases. It was to a section of the town—a low lying island—that the Hecta came from Cuba with copper ore. Those who had the fever were some distance from the vessel. Dr. Buchanan says: "It is a remarkable fact, that the Bristol and Swansea pilots, the five seamen who helped to bring the ship into harbor, the Custom House officers and men, and almost all the men employed in the discharge of the Hecta's cargo, escaped, although they had much more direct dealing with the ship than the persons who were attacked."

This and other detailed statements go to show against contagion and in favor of air dissemination and there origin. See the difference in this case from that at Port du Passage, where too it might have originated on shore, and into the quarters noted and into the hold of the vessel gravitated, but where at least men died who worked on timbers in its evidently heavy, rotting hold, though possibly coming from and sleeping in the filthy town quarters referred to, and where it may have previously germinated. But visitors to the Hecta were differently

treated, or fared better. "Among the cases of yellow fever is one where a vessel lying close to the Hecta, while her cargo was discharged, left Swansea for a neighboring port, and there lost two of her crew of four, one of them pronounced certainly yellow fever." "Probably the climatic conditions that foster yellow fever in the West Indies have never been better imitated in Great Britain. The locality, too, where the cases occurred, a low lying alluvial island, at the mouth of a river, is such as is particularly favorable to this disease, in its native latitudes. In a great majority of instances, the disease occurred in individual, without communicating with any previous sufferer." This yellow fever demonstration again occurred in 1866, in Swansea. No vessel, I understand, chanced from Havana, and Dr. Milroy, in his report of it, read before the Epedemiological Society, 1867, denies personal contagion. This in bay-lying seaport, at the mouth of a valley, rich in the growth of sugar beets, to feed the stock, has contiguous to the port, many mines, especially coal and iron, (it is a coaling station,) and in the sections demonstrating yellow fever, has extensive shipyards, all of which, with tropical heat and humidity, are there capable of furnishing with cumulatations from the valley, a "phosphene gas," with the germination of yellow fever.

Within the Mediterranean, yellow fever is claimed to have shown as far to the east as Sicily, and a long, long time ago, is thought to have shown on the Nile. But in our day the sands of Africa in "Simoon," not only annoy the eyes, but with their intense heat and dryness almost threaten, when long continued, the total extinction of animal life, and the effect of this wind is proportionate to its continuance, and the then saturation of the soil over which it sweeps. This, in stages of cumulation, and hence readiness for demonstration, is the only

explanation of as far to the west as Malaga, sixty-six miles east of Gibraltar, the plague sometimes showing, and again the yellow fever, or as is recorded, the yellow fever first, drying out to the plague. Many compare our Mississippi valley to the Nile. The atmosphere is different entirely at its mouth into the inland sea, (Mediterranean) from that of the open Gulf of Mexico, loaded with humidity, which is shown in the different sky. In its lower section the Mississippi is comparatively oceanic in its air, and humid from its upland and contiguous verdure.

The "Great water" of North America is 3,160 miles in length, and drains the Rocky and the Allegheny mountains, or if you count from the source of the Missouri, it is 4,500 miles—and if you properly liken the North American Continent to a vessel—the channel of this valley water represents her keel. After we pass the Ohio ;—the White, St. Francis, Opion, Hatchie, Yazoo, Red and other rivers with their various tributaries in feeding the line of her course—show not like the Nile in its single stream through Egypt for over 1,500 miles. Egypt has no forests ; and the palms, acacias, cypresses, and sycamores are scattered about the country in favorable situations, in groups composed for the most part of 3 or 4 trees. Beyond Cairo the one stream separates into many branches, of which two only are now of any importance—the Rosetta and the Dabietta. The ancients numbered seven mouths by which this great river entered the sea, but you must not forget that they persistently planted on almost every foot of this valley, after cutting down of its timber ; and what fertility had been cumulated in time, and supplied from said moisture-holding trees, was used up and verdure and inhabitants both departed—and the sand section of Africa is asserted to be in all directions, spreading its peripheries and more and more felt on the Mediterranean

and Atlantic. The height of the hill ranges to the east and west of the Nile is 400 to 800 feet, and on the west side of the west range (the Libyan chain) is another valley —like claimed by some to have been another outlet for the Nile. It is now known as "the river without water." Even at the extreme lower end of Nile, there is in the year *never* more than 13 days of rain, and thunder and lightning are about equally *rare*. The prevalent winds are from the north, and continue from May to September, and from November to February. At intervals during the spring, for about fifty days, Egypt is liable to the terrible wind from the desert, the *Simoon*, which, fortunately, rarely continuously lasts more than three days. The advantage these residents take in the lower sections of the inundation of spring, the canals they cut, the reservoirs they build, the use they make of the Bourlos, Mariotis and Menzalch lakes, is to their credit. They much *control* the water, instead of which, in the Mississippi valley, the *water controls* us. The water which they get comes from far Africa direct, and with the upstir of the mud at their bay end of Mediterranean, it every season back coats their bottoms. There are a plenty of mycoderms, torulæ, and what not on hand, and enough individual filth and animalculæ; then why not demonstrate lots of yellow fever? The very same matter is conducive to it at the mouth of the same water only that there at Gibraltar, Cadiz, &c., it is met by the *ocean* water and air, and is farther away from the dry desert; and local humidity is supplied. In the Cairo section of Egypt they instead show the plague sometimes; of which Sir Joseph Fayner, former Surgeon General to India, and familiar with Africa, as well as Asia, in connection with the eminent Clot Bey, of Cairo, says recently, "it is not at all contagious, and that he had formed a decided opinion that personal contact with subjects of

plague, whether in life, or after death, with the clothing by post-mortem examination, or even by inoculation was not attended with danger." He attributed the plague to atmospheric influences, and while commending sanitary precautions in the strongest terms, he evidently attached but little importance to quarantine measures as a protection against this form of pestilence. The same remarks apply to yellow fever. If we cross to the west side of Africa on the Atlantic—o'er the plains of Barbary, which front toward the Mediterranean, we pass so vast a waste as the waters which run from the Atlas and central chains are unable to permeate, hence about 2,500 miles in length, and 700 to 800 in breath are consigned to irretrievable sterility. Only a few scattered spots, rising like emerald islands amid the general waste, from being favored by springs, appear here and there at wide distances to relieve the monotonous desolation of this vast ocean of sand; as terrific as it is apparently profitless to mankind. By Donald McKenzie's recent reports, portions of Sahara are claimed to show 200 to 300 feet below the ocean water level, and straits of similar material to those of Gibraltar to have been found, choked and covered with sand. It is proposed to open again said channel, and by inflow furnish inland transportation and humid interchange. With the little alluvia that marks these spots, the soil is composed of small particles of gravel commingled with marine shells encrusted with crystalizations of salt, all which shows the lack of humidity, often spoken of as "the tropical wave." You see that in the tropics where in the lack of vegetation no humidity from elsewhere in "wave" rolls. I mention this to prove that the epidemic humidity belongs to its mediate locality. No rain visits these plains; but if you strike the Niger, and follow it down through Soudan to its empty into the Gulf

of Guinea, between the Bight of Beatra, by several mouths, you find on its upper lines coal and salt mines, as on the Ohio, Kanawha and other Mississippi tributaries, and also the same carbonate of lime and soda demonstrations. This valley, rich in vegetation like the Mississippi, has demonstrations on the coast of the "Coral Rag," the limestone of Vera Cruz walls. There is plenty of rain, and of dew, and the epidemic visible vapors often rise in yellow fever demonstration. To the putrid fevers above this valley, fell victim all the leaders of Major Peddie's expedition, as fell those of Captain Tuckey on their return from being unable satisfactorily to go up the Congo. And after Lander, Captain Allen, backed by the British government with £65,000 tried in vain far to ascend these rivers, loaded with a density of vegetation. This Gulf of Guinea is divided into lower, called Congo; and upper, including Sierra Leone, the grain coast, the ivory coast, Liberia, the gold coast, the slave coast and Benin. This section of Africa is said to have been first discovered by the Portuguese in 1487, and has always been noted as unhealthy to Europeans; although the negro there might possibly say that the Portuguese introduced yellow fever. Senegambia, a *projection* of the coast is in sections tempered by the sand heats of Sahara to its rear, and is classed as unhealthy to Europeans, but the Gambia, a shorter stream than the Niger, and bringing the air from mountain range direct, has, at its mouth, a British colony, who in consequence of their cleanliness, at the mouth of this clean valley, have properly given this the reputation of being "the most healthy part of Western Africa."

We will now cross to Havana, the declared centre of yellow fever to-day, and there by force of circumstances recognized as indigenous, although years ago it was accred-

ited by them and others of the West Indies and gulf coast as coming from the United States. Havana fronts on the north side of Cuba, and her harbor, capable of holding 1,000 ships with ease, has a long and narrow channel strongly fortified, ditched, &c., like the city, which lies in a plain to the west side of the harbor. Mid-ocean we have no dews, they mark our decks in proximity to coast, but are extra clammy and heavy in this port. With its walls, its barracks, &c., notably in a sanitary point of view is its one stream, the River Laqida, from a very rich valley whose sides are loaded with the densest forest and bottom verdure. Much stock is raised, and contiguous to the city the shambles empty by this stream their bloody offal, with refuse from gas works to be spread upon a much exposed bottom. Dr. Belot notes all this, and her "magazines of molasses from which an infectious odor is exhaled;" and at the foot of the high bluffs on the N. E. side is the village Cara Blanca, where are the coal deposits, and of which he speaks as the "most unhealthy part of the roads." Here, too, is the aqueduct for water supply, and which turns the mill for the sawing, &c., of timber, for the there busy shipyards. The division of the harbor by the projection of the village Regla into its waters, makes a cut-up bay with only 2½ feet of tide to remove its comparatively stagnant matter. At some sections vessels have from lack of water to be loaded off shore, and much of shore used is natural and exposed consequently to action of cargo, sun and water. The prevailing wind during the hot (or epidemic) season is from N. or N. E. during the day; in other words, the wind to equatorial chimney, running along the coast and indenting at the gulf, and close to surface, cut up to suit the topographical lines of valleys, &c. Night shows the wind in reverse, from the mountain sides in the valley to the coast; and from

June to September these show strong direct from the south. The enormous difference of temperature between noon and midnight is sensible even to the natives and to the acclimated, who, like the sailors, fear the moon; and in fact in this alternate action of sun and moon lies the generating power of yellow fever, here and elsewhere, if materials be furnished; and the most prominent material is crude sugar or milado. The more woody the fibre or capsule the greater is the trouble to get the proper per cent. of granular sugar from the cane. 40 per cent. of value in the cane is calculated in "Special Agricultural Report of Sugar Culture" in consequence of lack of adequate machinery and chemical appliances, to be lost in the "begasse," waste. So you see what show is given mycoderm and torula in the Louisiana waste; boiling, and skimming and lime treating in quantity proves necessary to counterbalance the acid fermentation, and I have already noted the, by Belot recognized, "infectious odor of these molasses magazines." The sailor practically knows all about it, and when in port, loading molasses, &c., he has thousands of times said "Here comes on board Yellow Jack, batten him down and let us get out of here;" and this is the paragon cargo to furnish the yellow fever, and I claim that it is so, consequent upon the carbonic acid it will furnish—with bilge water in the hold. J. M. Turner, M. D., Health Officer of Savannah, was, in the *Savannah Journal of Medicine*, July, 1858, the first I find noting this matter. The difference being that I claim that this amount of carbonic acid gas by the salt bilge-water, as well as the sea air, is changed under sun to chloro-carbonous acid, or phosphene gas, as first called by Davy, when he noted its presence under sun in the combination and raisement of four times the amount of ammonia. This ammonia it

will pick up from all offal, vegetable or animal matter, and under the condensation of that planet cooler than the earth—the moon—these elements separate and fall. Even on shady side of street, the clammy chill (muriate of ammonia) will sometimes on wall be felt. When once this gas in demonstration of its solvent power, it will not only follow the lines of topography, in gravity and current, but its power will be shown in accordance to where found, cumulations of carbonic acid and resultants of animal or vegetable decomposition. Its affiliation for acetic acid was early noted, and, I claim, that this explains the heavy humidity and its kilinitic retention in proximity to earth. When man in this atmosphere becomes demoralized, its solvent power on him, as on other animal matter is shown, and following the change of bases (as felt) in the muscles and elsewhere, you have in separation the first ammonical demonstrations in exhalations of breath, and alkalinity of all secretions and excretions, and the water-brash with epithium mix. Next follow the muriatic and acetic demonstrations and the separation, as in saponification, of adipose into heavy fat found in liver and other tissues and the volatile aromatic oil contributing to color and odor, which latter similate chloride of azote, as in its expansive orange color. The pungent odor of chloro-carbonous acid in glass, under sun, in laboratory, may too, on eye, unsatisfactorily compare with the open atmosphere in which the yellow fever candidate tries to live. It is theory, on a chemical basis, and a crude accounting for "condition" which it is universally acknowledged must exist, to maintain in presumed existence of demonstration, the microphyte of the germist, and most nearly explains the action of the required ocean air. It is modestly suggested and is consequent of, not local, but general knowledge,

and of personal suffering; and is dedicated to the memory of brother and uncle; physicians, who in the valley of the Mississippi, of its epidemics died, in the harness. It is open for modification, elaboration or change, by those having ample opportunity to analyse the yellow fever atmosphere. My explanation of the power of crude sugar and molasses cargo is by the furnishment in fermentation of matter for dissemination, which, in an atmosphere already pseudo-saturated, as in New Orleans, might tend to immediate combination in phosphene gas, and consequent demonstration, but that in clear air, as in New York harbor, said cargo would be comparatively "wasting its sweetness on the desert air." This is æration; which in the port of New Orleans at times may be impracticable, especialty if, as Dr. Vanderpool suggests, they erroneously too long maintain cargo in hold. From all that I have seen and can learn, yellow fever has again and again germinated and demonstrated on our soil, and, whether its origin be chemical interchange with meteoric action, with or without some mycrophyte, our practical duty is the same, viz.: to first pay attention to the obviation of that specific "condition" at home, without which, whether microphyte be imported or indigenous, primary or *secondary*, all acknowledge there can be no demonstration. Without sanitation in and contiguous to port, a quarantine officer acting under the most approved New York or Leghorn system, would not succeed; as at times in the port of New Orleans when in saturation.

The explanation of the non-occurrence of yellow fever in New York, Philadelphia, Boston and Baltimore for years in the epidemic form is due in my mind to their sanitary regime, of which so called quarantine forms part and parcel, and that sanitation consists in the filling and grading of swamps, and along with other sections, *pro-*

tecting their absorbed matter from the action of sun, by the more dense stone, and by the use of sub-trapped, instead of superficial drainage, and the constant removal of all cumulations of offal, vegetable and general detritus. Dirt and filth should be buried at a proper distance from settlement *in earth*, or outside of harbor in sufficient depth of water. This is done in the places named, and here in earth rests the last but not least of sanitary powers. "Dust to dust" must be observed, and herein is the bearing in reference to elevation, as in connection with yellow fever. In that topography nearest level with the sea, especially if at the mouth of a valley, must be, in transit on rivers, and in cumulation in bottoms, a proportionate amount of general, organic, and inorganic ærial waste. If the soil be not deep enough and dry enough, carbonic acid, resultant of fermentation will in its various combinations remains in air in preference to water. Now in none of the named cities is there any such thinness nor saturation of soil as in New Orleans: they, therefore, possess independent of, but in connection with those aforesaid, that necessary disinfectant, Earth!

Our late (1878) epidemic started at the lower end of the Mississippi valley. In New Orleans, 12th July, the first case was noted, in Grenada on the 25th July, and a death was first noted in Marine Hospital, of Vicksburg; 26th July, and Memphis first recorded on 13th August. Then Canton, Beloxi, Placquemines, Port Gibson, South Pass, Port Eads, Baton Rouge, Bay St. Louis, Morgan City, etc. In Louisiana, in 15 localities; in Mississippi, 21, (the heaviest mortality bring in Vicksburg and Holly Springs, in all 2,493); Tennessee in nine localities, mortality 3,089; in Alabama in two localities, 41 deaths; in Kentucky, in two localities; in Cairo, Ill., 25 deaths; in Key West, Florida, 16; and in Helena, Arkansas, 15.

The lines of spread were Louisiana, Mississippi and Tennessee, and many of the high-up valley cases, were solely refugees, as in Mobile and Huntsville, Alabama, which the "infectious and contagious" disease treated with neglectful contempt in spite of their (and other unmentioned localities) furnishing a harbor for its victims. The cases at Key West are claimed by some to have occurred in connection with importation, and by others to have been endemic. The figuration of deaths to 18th October was about 10,000. The reports of Board of Health of Memphis and elsewhere have so fluctuated that no exactitude is to-day computable. The final report of Board of Health of New Orleans was 4,056 deaths from yellow fever. The gross epidemic mortality as by "Board of Experts" collected is "at least 18,000, and probably as many as 20,000 deaths from yellow fever, of this three-fifths minors and two-fifths adults." Starting in New Orleans 1878, for five months we note the usual atmospheric averages of epidemic seasons were observed.

Mean	June.	July.	Aug.	Sept.	Oct.
Temperature.....	18.95	83.83	83.59	78.75	71.42
Humidity.....	71.0	71.0	71.6	71.4	69.5
Barometer.....	29.98	29.98	29.95	30.02	30.07
Rainfall in inches:.	7.12	5.26	4.90	2.67	5.07

The cry of "importation" is heard in the upper valley and by many repeated here, but by the majority, and among them the most prominent resident physicians, it is in 1878 believed to have amply demonstrated before the arrival of vessel to whose importation it has been charged. The preponderance of evidence, is that it originated at home, and this I say after a diffuse correspondence and in contradistinction to the expressed conclusion of "expert commission," which was based not upon the

hearing of evidence as collected by Falligant and others, but upon preconceived opinion, directed by the master mind that is no more. From Prof. Jones' clinique, and Carrington's official report, I draw some of the following notes. Of arrivals at New Orleans' quarantine stations, in April, May, June and July, only three vessels were claimed as infected. 1st, the "Emily B. Souder," May 22d, had cases of intermittent fever, which were transferred to Quarantine Hospital. She was detained and fumigated, passed up the same day, and presented clean bill of health to Custom House Officer. "Clarke," the purser, was ill when the vessel reached quarantine, but managed to pass inspection, as suffering from merely neuralgia. Upon arrival at New Orleans, he was carried in cab to corner of Claiborne and Bienville streets, where he died in convulsions, it is said, on the 25th May. Both on ship and on shore, Clarke was attended by Dr. Drew, a physician familiar with yellow fever, who affirmed that it was a case of malarial fever, and gave a certificate of death to that effect. Tom Elliott, engineer of the Emily B. Souder, was taken sick at the Sailors' Boarding House, 22 Girard street, corner of Front, on the 24th May and was attended by Dr. Loeber, who regarded this case as one of malarial fever. He was removed to Hotel Dieu on the evening of May 29th, where he died within a few hours. This was pronounced intermittent fever by the attendant physician, but was declared to be yellow fever by the President of the Board of Health, who inspected the body after a post-mortem had been made by two physicians. "The usual means of disinfecting with sulphurous acid was used in and around the houses where Clarke and Elliot had been sick, and when they were removed no more cases followed within a period usual for the spread of yellow fever."

The British steamer Borassia, left Havana on the 18th

of May, and arrived at Mississippi quarantine station on the 21st, with five cases, (two passengers, three crew) of whom three died at hospital at quarantine. The crew numbered forty-seven, the passengers, fifty-one; total ninety-eight. This vessel was detained eleven days, and fumed four hours each day with sulphurous acid gas. The cargo was not removed. No other cases are known to have occurred on this steamship. Most of the passengers went to Texas.

On the 28th of July, F. L. Richardson, eight days from Matanzas, arrived at quarantine station with three cases of yellow fever, one of whom died. The crew consisted of eight, and had one female passenger. The Richardson was detained eleven days, and fumed with burning sulphur. In none of the previous instances was the cargo removed during fumigation. It has been intimated, that other vessels entered the port of New Orleans with yellow fever, and that the quarantine was violated by fruit vessels, and other ships entering from infected ports. We have not, however, been able to trace such statements to any reliable source. You note only seven cases of yellow fever at quarantine, from April, to the end of July. "The epidemic of 1878, has added," says Prof. Jones, "another demonstration of the difficulty of establishing an absolutely efficient quarantine at the outlets of the Mississippi valley. Even if we admit that Clarke brought the yellow fever to New Orleans it confirms the experience of those who have studied the history of the yellow fever in this valley, that it is exceedingly difficult, even with the most rigid quarantine, to exclude yellow fever from New Orleans, especially as she has so many avenues of communication with the Gulf of Mexico, and the Antilles, in which yellow fever is supposed to be indigenous. Chaille, in "Vital Statistics of New Orleans, from 1790 to 1874," sums up

as to the failure of quarantine, abandoned in 1825, and after thirty years discontinuance, re-established, with result of violent epidemics in 1855–58 and '67, and excepting 1861, deaths every year of the existence of the present quarantine, and says "New Orleans has a capacity to originate yellow fever, just as well as Havana and Rio Janeiro, and this is an assertion that I deem indisputable, and so said the deceased Prof. Stone."

The practical conclusions from the above, for the consideration of all citizens, and of their representatives in Congress assembled, is that the only surety is in Home sanitation; of New Orleans, its mouths of exit, and contiguous valley, and the same in general applies, but specially in reference to our sub-tropical sections. The recent craze on *quarantine*, defined forty days detention, and the expressed desire to be paid to investigate abroad, that of which we in filth have more than enough at home, instead of, as in charity, beginning our cleanliness here, reminds me of the, on similar occasion, *apropos* comment by the lamented and illustrious Barton: "The determination is now come to take the shorter cut and adopt the desperate course of denying the truth of more than fifty years experience, altogether, and attribute all our ills to a foreign source, not only against every theory of probability, but even where the common law of error does not exist, rather than have the manliness to acknowledge ignorance, and set about correcting it, at even so late a period." Humbolt's theory, that yellow fever is "*un accident d'une saison*," the acme of the acclimating fever of some sub-tropical sections and is very closely allied to malignant malarious fevers, is by many shared. That acme I attribute to the fact that

> Little or much, of all we see, we do,
> We're all both actors and spectators, too.

Instead of demonstrating the effects of irritation as in other grades of fever, all those, as the foreigner or the Northerner, who, in grade from the Esquimaux down, carry in their bodies an amount of fat and material for combustion, which, when in a yellow fever atmosphere, (in active change of base, in ferment,) furnishes in said individual material for dissolvement, which the native never finds necessary or proper to carry. There takes place in the Northerner, exactly what is taking place in the atmosphere, in which he, not to the manner born, attempts to live. Benj. W. Richardson, M. D., F. R. S., President of the Sanitary Congress, at Leamington, England, October 3d, 1877, included yellow fever as among those diseases demonstrated consequent upon abnormal *glandular* action. The liver, to my eye, demonstrates *general dissolvement*, and its inability under this radical positive fermentative action, to perform those anti-toxic duties in which it normally so manifestly, plays its important part. Milroy, in his summary on yellow fever, says: "It is like alvine fluxes and enteric fevers, manifested from July to November, and like them, too, its *origin* and *malignancy* are powerfully promoted by *local causes*, if insalubrity and atmospheric pollution, low lying and foul foreshores of harbors, where water is stagnant or nearly so, and the immediate neighborhood of undrained, filthy wharves. Hills, dry inland spots, are comparatively exempt, unless their natural advantages are counterbalanced by the artificial sources of impurities, as has been the case with the military station in the West Indies and elsewhere." These comments by Dr. Milroy, we only apply to the lines of yellow fever, as noted by him and others. Here is a recognized necessity by England, the acknowledged leader in the science of hygiene and sanitation, of attention to local causes, and of their removal;

and, although she does lie on the border of the yellow fever zone, in an isolated position, the same criticism does not apply to small pox, &c., and yet so satisfied is she of the sovereign protection of home sanitation, that after centuries of experience, she opens free her ports to the floats of the world. France and others in their continental intelligence are in followance of her example.

Prominent among the present champions of home sanitation in belief of the thereby prevention of yellow fever epedemics, whose poison is recognized as indigenous, I may mention Dr. J. C. LeHardy, of Savannah, recent author of a valuable essay on "Quarantine," read this year before the Medical Association of Georgia, and among the familiar names of those not already mentioned, I may enrole those of LaRoche, Drake, Potter, Condie, Falwell, Andrew Elliott, Holt, Campbell, Watts, Merrill, Daniell, Waring, Hill, Strobel, Hert, Natt, Gaillard, Monette, Simmons, McCall, R. D. Arnold, Jewell, J. J. Harris, Axson, Delery, E. Harris, S. A. Smith, Lebby, Bailey, and others, who are all emphatic in their declarations, which are based upon facts. A fit sample being the following, from Dr. Jos. Holt's "Sanitary Inspection in Analysis of Yellow Fever in New Orleans, 1876:" "Careful examination by the President of the Board of Health, by the sanitary officers, and by myself, failed to discover in the first case the slightest clue to foreign infection, *from any ship, person or material;* this applies with equal force to the following series of cases."

As to the efficacy of quarantine proper, as before noted, it bears no practical inspection. As shown in radical enforcement at divers periods, in the different localities, from and before 1700, its ridiculous fatality is evidenced in history of New York, by Woodworth, of Philadelphia, by Rush, LaRoche and others, of Charleston, by Tucker,

Harris, Dawson and Dr. Libby, of Natches, by Drake and Monette, and in New Orleans, independent of Barton and others, by the *military quarantine*, which did not prevent the gravitation on the water surface, of the poison into the holds of gun-boats, there reinforced by the culinary department and ochlesis, to in chemical dissolvement, demonstrate yellow fever. Butler's washings and cleansings of New Orleans did much local service to that place, and could with propriety be practised to-day; but although he came from a section where the "Yankee," with ready wit, long since was smart enough to turn an honest penny by the use of God's disinfectant, in the sale of his *Earth Closet*, Butler found not time to drain the swamps and the shores of the Mississippi, until which is done, yellow fever will be, spite of all imaginary or other quarantine, *un accident d'une saison*. Jones says: "Many writers have held that the disease was unknown in this city, (New Orleans) from its foundation, in 1717, to 1796, during which time there was no quarantine, whilst there existed frequent and uninterrupted intercourse with the West Indies." Its futility in Mobile, is shown in the notes of Holt, and in Baltimore, my father, Dr. Alex. Clendinen, in 1819, demonstrated to the satisfaction of the Mayor, profession and people, its domestic origin in Pitt Street docks, filled with cord-wood and chips, and like a yeast tub lided (with thin dirt). The result was the practical abandonment of quarantine, but attention to sanitation at home, and her free communication with Norfolk in epidemic 1855, is noted by Kemp.

The records of quarantine in Norfolk and the appreciation then held of the same, can be judged from the fact, as noted in letter to me by Dr. Seldon, in speaking of the "naval hospital, for more than sixty years having, to his personal knowledge, received from quarantine and men-

of-war, yellow fever cases, and of there having been no separation from other patients, no 'disinfectants,' and yet no contagion demonstrated or feared." The record of Norfolk, as of other ports, is, that yellow fever respects not quarantine, and the same may be said of cholera, in connection with which we note the declaration of Dr. Cunningham, the Sanitary Commissioner in India: "Quarantine was tried in 1872, (when cholera existed as an epidemic ;—it constantly sporadically exists), in the hope of protecting a number of the cantonments in Upper India. In many of them it signally failed, and in no instance is there any ground for believing that it was productive of any good." And E. Chadwick, C. B., says: "A reactionary course, that has threatened interference with the course of sanitation in India, has been, in directing attention to personal contagion, as the chief means of preventing the spread of the disease, by the reinforcement of quarantines, the workings of which we had examined, and upon that examination had declared them to be useless and mischievous, even upon the hypothesis on which they were maintained."

The specially noted diagnostic points of the late epidemic, in radical cases noted by correspondents and furnished in answer to my 150 circulars of inquiry—to physicians engaged in late epidemic were, the first demonstrations of alkalinity and ammonia in secretions and excretions, breath and general exhalations. The excess of muriatic acid in stomachic discharges, and elsewhere the evidence of sulphuric, acetic, and other acids, the steady increase in temperature up to 106° and even 112°, at the same time as was in evidence the oppression of heart by demonstration of gaseous pulse, beating in waver slower and slower down to, and below 40° ; the gaseous condition of the very capiliaries as

shown in the puffy, spongy but non-elastic surface; the evidences later in blood of corpuscular disintegration, (dissolvement by ammonia and burnment by muriatic acid) as portrayed in black vomit, examined by Middleton Michel, of Charleston, and the *final acidity of blood in blood vessels in heart, and markedly in connection with the nerve tissues—brain- spinal marrow, and sympathetic*, together with evidence of general adipose dissolvement, as shown elsewhere, but specially in the—*cafe au lait*—liver, in connection with the there too deposited cholesterin. All these demonstrate, to my mind, nervous demoralization entire; there are various cerebral and spinal marrow lesions noted, but the *ganglions springing from the great sympathetic nerve and forming the solar and semi-lunar plexus are always more or less involved.* Albumen showed sooner or later in urine, proportionate to the violence of attack. The changes of base are active in fermentation, and I hear from Mississippi, of bodies evidencing such active dissolvement and muscular disintegration as in many cases to have been hard to handle, without breaking to pieces. The microphytes in their more than mycodermic action, were very active. In answer to my queries as to the acidity of blood one of my correspondents answered that "acidity in vessels was incompatible with life." That is exactly what I thought about it, especially in seeing it kill so many yellow fever patients. Another wrote that "in this age it was not the fashion to bleed;" and yet another that, "in the hurry and scurry of attention to the dying they had never found time to notice." To Dr. B. S. Thompson, in connection with number of elaborate autopsies and examinations during life, noted during the war, and in connection with Key West epidemic, and to Dr. Jerome Cochran, and J. S. Mosher and others in confirmation, and in noting the various grades from alkalinity to

neutrality and acidity, I am especially indebted. The fever has shown also, in its various grades of intermittent, remittent and bilious demonstration, which latter only shows with what accumulation and labor the liver will endeavor in exercise of its anti-toxic power to free the system, and explains the difference in character of vomit, of blood and of yellow color, whilst in acute (positive) yellow fever the demoralized liver is unable to at all handle these matters, which consequently through skin and all tissues strive direct in ferment for exit; which in cephalic, stomachic, intestinal, and skin surface hemorrhage in various degrees they get; and in organic congestions and effusions in gainment of relief, you see the pulse run up in number, fullness and vim, unless there have been too great a loss. This disease in its gaseous molecular spread found a new home in Memphis, environed by swamps, loaded with filth, in some lines of travel hid and fed by its wood pavements. There were many radical cases. "The accumulations of forty years were decaying upon the surface; a bayou dividing the city, and which was the receptacle of all the city filth, was sluggish and without current owing to the want of water. Dead animals were decaying in many parts of it, and the pools which had formed at the abutments of the bridges were stagnant and emitted deadly effluvia." I say that Memphis by float contributed to the 1878 "importation" demonstration at New Orleans, and that her unused filth may in 1879 "show," whilst the sun neglects to revivify the "germs" of New Orleans. In some sections of inland Mississippi and elsewhere, on the railroad lines it was variously noted as Plague-like in its demonstrations or co-existence, the same may be said of Dengue, and there have been many typhoid sequelæ. In its various so-called comminglements, it is often not to be

distinguished from intermittent fever of neuralgic type, and this remark applies not only to this epidemic and the before notes in reference to vessels arriving at New Orleans in May, June and July, but throughout all time, the captain or mate might show "malarial" fever or "neuralgia," which the cook or those in hold or forecastle graded to "black vomit." The illiterate sailor has spoken of this. You see by the records, that "intermittent fever," so declared by experts, requires a post mortem to tell the President of the Board of Health that it was yellow fever, and some doubt the certainty of that. You can now understand the often wrangle over statistics and number of assumed cases. As a general practical rule black vomit and death alone distinctly demonstrate yellow fever, and when once an epidemic starts, the division is often more in the head of the doctor than in the body of his patient. If you will study it in Havana, or if you will read Belot and his tremendous experience there, and statistics of fifty years, with notes of microscopic and other observation, during and after life, of cases by the thousand, you will with his too confession of mistakes, disinterestedly come to the conclusion that the toxic of yellow fever is as various in its demonstrations as are sulphur, saltpetre and charcoal, whether in separation or in certain proportions mixed. The changes of base evidenced in the flashes and detonations from above, were responded to in sympathy and co-action by those in the patient. This pernicious power has been recognized for many years in Havana, and certainly the dormant irritability of the negro gave evidence in the inland, Woodville, on plantations, of its being awakened to death. The record of this epidemic has been against the too indiscriminate and heroic use of quinine and in favor of an early use of atropia, aconite, and White's Bradycrote treatment. The primary indication is

diaphoretic, counter irritation, practices sanctioned on the Congo and in Cardinas, by the smearing of mustard from sole of foot to head, leaving out only the face, all else being blanketed over steam. Some primary emetic for the unloadment of stomach, and mercurial cathartics, and *refrigeration at the base of brain*, to the coverment of the carotid have good records, but superficial refrigeration has not. The secondary use of arsenious acid is highly commended. Coleman notes the death of 43 out of 44 unacclimated physicians, volunteers in Memphis from Missouri, and says they took daily from 20 to 30 grains of quinine. So much for the fashion of the day! As before stated, yellow fever did not in all sections respect "gunshot quarantine," but in Huntsville, Mobile and other places, where the sick were received on the lines of water and railroad, there were no local demonstrations. The infectionists cannot say that no smugglers, or pedlers or merchandise had attended to transportation; the contagionists know not what to say, except that the "inscrutable" atmosphere was not in "condition." My explanation is, that the places are locally, from topography, elevation with depth of soil, lack of basins, or from any cleanliness of man, or kindness of God, in air currents or otherwise; not in holdment of cumulations and humidity; if they were, and enough foreigners or northerners present, they, if by foul atmosphere surrounded, would furnish in their bodies also, organic extra matter for demonstration. Years ago, autumn of '39, on a small islet off the east coast of Florida, Commodore A. Murray writes me, that he landed some of the men, who, among other pastimes, fished at "Indian Key." A barrel of pickled pork on its sand beach, was to sun exposed in the procurement of bait, and forgotten until it proved in its sea-washed and sun-putrified power the engenderment of yellow fever, as with black vomit and death

demonstrated, by the few men in its immediate locality. No vessels stopped there at any time, no epidemic was anywhere around, and the people of the shore, all in health, could not explain its cause till this was found. Why! the man to section born, not only steers clear of such matter on shore in sun exposed, but he will in season trust very little meat in his stomach indeed; true, he is not smart enough to know that it is the microphyte that may kill him for his meat, but he is smart enough to let it alone and to shun the moon, and any over exertion of mind or body, and, as before stated, the non-cumulation, in body of native, his care and his accustomance, together account for his exemption. Prof. Jones, in his *Cliniques*, (*N. O. Medical and Surgical Journal*, March, April, May, 1879), narrates examinations by him of air of sick rooms, contiguous gutters, &c., by the passage of the same through iced water, and the finding of organic living particles, properly sporules having a diameter ranging from $\frac{1}{10000}$ to $\frac{1}{20000}$ of an inch, also, living animalculæ, together with minute particles of fatty bodies, scales of the human body and fibres from clothing and bedding. The sporules resembled most nearly the micrococci and cryptococci of Hallier. He found also bacteria in air and blood; the blood was examined immediately after extraction. In black vomit, a short time after ejectment, it showed spores and thalli of torulæ. "The excretions and secretions in yellow fever, have a delicate fungus, evidently a species of the plant which produces fermentation in beer and yeast." The Doctor deserves great credit for his examinations of the air, and his finding evidences of fermentation in all secretions and excretions—tends to support my theory of dissolvement, and whether the "bagasse" and other waste in ready fermentation specially contributed yeast plant, or it comes of man proper, can be hereafter seen.

Other matters mentioned are to be found without yellow fever, and algæ and others were not uniformly, but in divers sections most congenial found. Bacteria and other matters have been in blood before harmlessly found and by Prof. Jos. Richardson of Philadelphia, in himself introduced, but no yellow fever. Dr. Jones tried, unsuccessfully, subcutaneous injection into pigeons and rabbits.

A drop from gutter water, not in yellow fever season or section—and before any blue or other scum appears, may be found crowded with bacteria and confervoid growths—and bacteria in sealed cells, have for two months of observation, been noted as in distention (life) an average of eighteen hours, and from under mass again and again, to bubble out; but *no increase or evidence of producing germs.* They are, in fact, given off like soap bubbles from all vegetable life, to form in juncture and contribution, new and other forms of life. They, and other so called vegetations of various spiral and other forms, (in complement to the conformation of the channels from whence they come) are not alone the results of putrescence but in our normal changes of base, enclose in protoplasmic bubbles, carbonic acid in its various compounds. They have been noted in the urine, fresh drawn by cleansed catheter, and in the clots with miscarriage just out of the uterus, showing that *we* contribute the stock to that which the atmosphere contains, and the difference in amount found in fresh urine, whether acid, neutral, or alkaline, shows them the resultants of chemical change of base, which when not normal, causes the presentment by protoplasmic enclosure in extra platicity of various conformations, often erroneously classed as of foreign introduction, and the more so thought in consequence of the varied local irritation and sequent more general demonstrations. All truly foreign matter, animal or vegetable, has in circulation, local and

general irritant and impediment power, and in death its putrid power, but I believe, not in any special germ. These matters, concomitants with yellow fever, are co-resultants of the *causa causans*, "condition." As to Greenville Dowell's "*contingent contagion*;" the abnormal glandular action of skin, in its immediate presentment in extensive surface of, (with "sour mash" odor) exhalation, is to be considered; but I have never yet seen or known of demonstrations, by which I was warranted in saying more than that it may be contractable from one individual by another upon the principle of—in sardine box. If a number of yellow fever cases, either walking in passive, or lying in positive death, were to any port removed, and along with vegetable matter exposed in humidity on saturated soil, to continuous sun and ocean air, they, like Com. Murray's barrel of pork, would, in their addition of animal matter, add "material in process" to the general formation of "Phosphene" atmosphere, and the consequent demonstration upon those present, who were physically demoralized and presented for action *extra* material, and the fact, that on the heights of Havana, or other not enclosed positions, *infection* by *fomites* proves futile, shows that they only in concert with *other* ingredients, if present, can contribute to a local or general charged atmosphere, but have *per se* no direct action.

Ground-air will hold and maintain 50 per cent. more carbonic acid than ground-water—which latter it is therefore plain gets it from air and not *vice versa*. In June and July, in Munich and Dresden, the heaviest per centage was shown in the upper stratum. Prof. Max Von Pettenkofer, of Munich, says: "I found that the quantity of carbonic acid, is smaller at fifty-eight inches than at one hundred and fifty-six inches, throughout the year, the months of June and July excepted, when an in-

verse proportion arises. But then there begins also, in the lower stratums, a considerable increase, so that the upper stratum soon finds itself behind again. This large quantity of carbonic acid has been far surpassed in Dresden, * * * nearly twice as great in winter already, as in Munich, in the month of August." Now, if change of topography &c., will show there, what ought it to show at night in the Mississippi valley, especially at times and sections where it has no thirteen or fourteen feet to be measured in. In her bottoms it is in quantities, and as it comes out, by sun, from pseudo-saturated soil, it brings its humidity in conjoint and alternate action with the sea air, to sometimes generate enough of *phosphene gas*, for yellow fever poison, and until a system of "dry culture," commended by the agricultural department for the increased use of sugar lands, in connection with the local sanitation of New Orleans and all settlements; is put in practice, I see no safety for that valley.

In New Orleans, the "nuisances" of the molasses magazines and docks, of which Barton speaks, must be remedied. Her dead must not be piled in tiers in her midst, as now, (there being no ground in which to bury them). Cistern water if continued to be used, should, at least, be upward filtered through porous iron, and along with deepening of channel and attention to swamps, &c.—streets, *cross* and all, should be paved, and by sub-traps drained, and constant régime observed in the washings of *all* street surface, now so inadequately done by costly steam. "Dry culture" and all this system will prove satisfactory, I think; although a very tall chimney is suggested to o'ertop the *yeast lid* of the valley.

A port officer with facilities, is as requisite as the porter for a city house, and should form part of the local sanitary regimé. The filth of the city should be removed

and filth from any other city, either by rail or water, not allowed to enter. An outer harbor should be always used, with æration as in Leghorn, and plenty of water and brooms in bilge pumping and washing; and with hatches battened where needed; with high pressure, super-heated steam—followed by vacuum—refrigerant; hose should withdraw from stern-keel and lowest spots, air supplied at bow, after passage through disinfectant. This is the only show for the abstraction from pores and seams of timber and merchandise of the millions of so-called "germs" and their displacement and outcast from the various nooks and corners and keel, to which they have gravitated, and the whitewashing of hold with carbolate of lime has a staying disinfection. Air as well as water must be continuously removed from keel—otherwise those engaged for sufficient time in propinquity are liable to demonstrate the futility of the so-called disinfection of even "authoritative" New York; and the proposed fire of the national experts would only disseminate on its wafts, quadrillions of germs not destroyed by it. The only way is to look at it from a chemical point of view As to the positively complete destruction of so-called germs, that is impossible, because the saturated hull is proportionably capacitated for the refurnishment of the same.

The general Government, to whom by States, was conceded the right of collection of revenue from the commerce of their ports, can, in propriety, contribute to the cleanliness of the same; but all local management should be left to each section; except that a general like regime should be exacted, so as in no manner to be to the prejudice of New Orleans or any port; this the country at large can safely do, for quarantine, as interpreted detention, is by the history of world and the intelligence of its most commercial sections, and scientific classes, recog-

nized as injurious. Our system should, in effect, offer to the commerce of the world, *pratique*. No fees to be paid by vessels for inspectments, and all cleansing and lighterage to be by captain or consignee paid at minimum figures, to health department. Upon finding, by port officer, of vessel in unsanitary condition, the fault of captain, a code of fines having been established, said fine should from captain or consignee be collectable by and for the benefit of health department. A system of hospitals, much on the order of those recommended by Dr. Vanderpoel, should be adopted. By a National Board of Health, of State delegation formation, and by act of Congress legalized, upon report of port committee, details of port sanitation, as here suggested, should be formulated along with a general inland sanitary code, to be by rules and regulations observed in every city and throughout every state or territory. In default of which observance, officers should be appointed by standing committee of said National Board of Health, to be paid under a uniform system of salary, payable by National Board of Health from collected assessments through custom house and health officers, upon the foreign and domestic commerce of the State. The bill should be so passed, as to arrange the percentage of Custom House contribution to port fund. A special act should be passed by Congress, appropriating funds for the general sanitation of the Mississippi valley, commencing with the necessary line of levees, and such lines as by sanitary commission decided, and extending to the exit of waters into the Gulf; providing for attention to deepening of channel, and such cross canaling as for the perfection of "dry culture" may be deemed necessary for the controlance of water and possessment of sufficient dry earth to disinfect this section. The assessments of benefit, in an agricultural point of view, will by the sev-

eral States, be with interest, speedily with ease repaid to the public treasury. For the sanitary repute of our country, for the general good, this action is requisite, in order to insure the doing of that, which, as the divided territory of impoverished people, it is impossible otherwise to do.

The above mode of formation of inter-State sanitary code, of city, county and township observance as formulated by Congress of delegates from health boards of the various States, nationally and by States adopted, is the only way to secure to the people the services and advice of those professional men, whose interest is *pro bono publico*, but who have neither time nor taste for commingle-ment in pot-house politics or patent job disinfectants or quarantine sinecures. Our State Board of Health deserves great credit for its labors and accomplishments,—but it much lacks power. In the matter of vaccination no requirement or provision is made, and in my section—on the Palisades of the Hudson, opposite, and in constant connection with the city of New York; I (in consequence of the example of that city and the by laboring class, &c., properly presumed propriety of our State to attend to the matter) am obliged to yearly, gratuitously vaccinate many.